

Appl. No. 10/785,480
In re EDMONDS, I.
Reply to Office Action of November 2, 2007

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Presently Amended): A method for producing a multifaceted, self-supporting, angle-selective light redirecting system comprising:

(a) laser cutting two or more arrays of parallel laser cuts through or partly through a flat sheet of transparent acrylic plastic with narrow strips of solid transparent acrylic plastic being left uncut between adjoining arrays of laser cuts, said arrays of parallel laser cuts covering a segment of said flat sheet in a pattern such that [[the]] removal of said segment of flat sheet and [[the]] folding of said segment of flat sheet along [[the]] lines of the narrow solid strips between each array of parallel laser cuts in the segment would result in a multifaceted, three dimensional structure of saddle, pyramidal or higher order form;

(b) cutting and removing said segment out of said flat sheet;

(c) positioning said segment on a table such that one of the narrow strips of solid clear plastic between the arrays of laser cuts is aligned directly above a narrow linear heating element slotted into [[the]] a surface of said table;

(d) applying electrical power to raise [[the]] a temperature of said linear heating element such that the narrow strip of solid plastic between adjoining arrays of laser cuts in said segment is heated and softened;

(e) folding said segment along one of the lines line of the narrow strip which has been softened through an angle suited to form the formation of the required three dimensional structure then allowing the narrow strip of plastic to cool and solidify;

(f) repeating the procedure of steps (c), (d) and (e) for each narrow strip of solid plastic between adjoining arrays of laser cuts so as to form a multi-faceted, three dimensional, self supporting angle-selective roof lighting system with each facet of the system having an array of laser cuts through or partly through the facet.

Claim 2 (Presently Amended): A method for producing a multifaceted, three dimensional, self-supporting, angle-selective lighting system comprising:

(a) laser cutting two or more arrays of parallel laser cuts through or partly through a flat sheet of transparent acrylic plastic with narrow strips of solid transparent acrylic plastic being left uncut between adjoining arrays of laser cuts, said arrays of parallel laser cuts covering a segment of said flat sheet in a pattern such that [[the]] removal of said segment of flat sheet and [[the]] folding of said segment of flat sheet along [[the]] lines of the narrow solid strips between each array of fine parallel cuts in the segment would result in a multifaceted, three dimensional

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structure of saddle, pyramidal or higher order form; in the case of a saddle form each of the two facets being of rectangular form and in the case of a pyramid or higher order form each facet being of triangular form with a base and a peak; said arrays of parallel laser cuts being made parallel to the base of the facets;

- (b) cutting and removing said segment out of said flat sheet;
- (c) positioning said segment on a table such that each individual narrow strip of solid clear plastic between the arrays of laser cuts is aligned directly above one narrow linear heating element of a group of narrow heating elements slotted into [[the]] a surface of said table;
- (d) applying electrical power to raise [[the]] a temperature of said linear heating elements such that the narrow strips of solid plastic between adjoining arrays of cuts in said segment are heated and softened;
- (e) folding said segment along the lines of the narrow strips which have been softened through an angle suited to form the formation of the required three dimensional structure then allowing the narrow strips of plastic to cool and solidify so as to form a multi-faceted, self-supporting, angle-selective roof lighting system with each facet of the system containing an array of parallel laser cuts through or partly through the facet.

Claim 3 (Presently Amended): A method for producing a multifaceted, three-dimensional, self-supporting angle-selective light redirecting system comprising:
cutting a segment from a flat transparent sheet of acrylic and folding or moulding said

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segment of acrylic so as to form a multifaceted, three-dimensional self-supporting structure of saddle, pyramidal or higher order form; in the case of a saddle form, each of the two facets being of rectangular form and in [[the]] a case of a pyramid or a higher order form, each facet being of triangular form with a base and a peak;

cutting an array of parallel laser cuts in each individual facet of said three dimensional structure with a laser cutting machine, said laser cuts being made parallel to the base of the individual facets forming said structure and said arrays of laser cuts being made through or partly through each individual facet of the three dimensional structure such that each facet of said structure acquires a light redirecting property.

Claim 4 (Previously Amended): A method for producing a three-dimensional light redirecting system comprising:

cutting from a flat sheet of transparent acrylic material a disc having an inner edge and an outer edge, said disc having two radial edges defined by a segment cut from said disc such that on deformation of said disc into a three-dimensional form the radial edges would join;

making a series of laser cuts about a centre of said disc, said laser cuts being made through or partly through said disc at a radial spacing between the laser cuts and at a cut depth such that the ratio of radial spacing of laser cut to the depth of laser cut is substantially in the range 0.4 to 0.7;

softening said disc by heating and deformation of said disc into by compression between

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two three-dimensional moulds;

cooling the moulds and said acrylic material to below the softening temperature of said acrylic material and removing the cooled and solid three-dimensional acrylic material from the moulds; and

joining the radial edges of said laser cut acrylic material.

Claim 5 (Withdrawn) A multifaceted, three-dimensional, structurally self-supporting angle-selective light redirecting system as in claim 1 positioned in an aperture in the roof of a building to increase the acceptance and transmittance of low elevation sunlight to rooms below and to reduce the transmittance of high elevation sunlight to rooms below.

Claim 6 (Withdrawn): A multifaceted, three-dimensional, structurally self-supporting angle-selective light redirecting system as in claim 2 positioned in an aperture in the roof of a building to increase the acceptance and transmittance of low elevation sunlight to rooms below and to reduce the transmittance of high elevation sunlight to rooms below.

Claim 7 (Withdrawn): A multifaceted, three dimensional, structurally self-supporting angle-selective light redirecting system as in claim 3 positioned in an aperture in the roof of a building to increase the acceptance and transmittance of low elevation sunlight to rooms below and to reduce the transmittance of high elevation sunlight to rooms below.

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Claim 8 (Withdrawn): A conical self-supporting angle-selective light redirecting system as in claim 4 positioned in an aperture in the roof of a building to increase the acceptance and transmittance of low elevation sunlight to rooms below and to reduce the transmittance of high elevation sunlight to rooms below.

Claim 9 (Previously Presented): The method for producing the three-dimensional light redirecting system as defined in claim 4, wherein said three-dimensional light redirecting system is conical in shape.

Claim 10 (Previously Presented): The method for producing the conical light redirecting system as defined in claim 9, wherein said inner edge is defined by a smaller inner radius about said centre and said outer edge is defined by a larger outer radius about the same centre, said radial edges of said disc are defined by said segment cut from said disc such that on deformation of said disc into conical form the radial edges would join to form a truncated cone.

Claim 11 (Previously Presented): The method for producing the conical light redirecting system as defined in claim 4, wherein said series of laser cuts in said disc are concentric cuts made about the centre of said disc.

Claim 12 (Previously Presented): The method for producing the conical light redirecting

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system as defined in claim 11, wherein said disc is deformed into a conical form by compression between two conically shaped moulds.

Claim 13 (Previously Presented): The method for producing the conical light redirecting system as defined in claim 12, wherein said conical light redirecting system removed from said conically shaped moulds is in the form of a solid truncated cone.

Claim 14 (Previously Presented) The method for producing the conical light redirecting system as defined in claim 13, wherein said radial edges of said laser cut truncated cone are joined with acrylic adhesive or other means.